Student Engagement in a First-Year Accounting Subject

1. Introduction

The aim of this study is to provide further evidence as to what drives student performance. Numerous studies (for example see Launius 1997, Thomas and Higbee 2000, Clump et al. 2003, Moore, 2003 and Gump 2005) have examined the link between tutorial attendance and student performance within a tertiary setting. Whilst the general conclusions are that reduced attendance is linked to decreased performance, these studies are unable to determine whether it is tutorial attendance or some other unobservable factor which influences performance.

With students becoming increasingly time poor and a rise in flexible learning options, it is possible for students to be engaged with the subject without necessarily attending tutorials on a regular basis. For the purpose of this study, engagement is understood to mean making use of available subject resources to better understand the subject content. It does not necessarily mean that the student will attend tutorials. Some students view tutorials simply as a means to obtain the answers for tutorial questions. If these answers are already provided online, there may not necessarily be a reason to attend.

This study uses data collected from the performance of over 5000 students over a three and half year period in a first year undergraduate business subject at a major Australian university. What makes this setting unique, as well as providing incredible insight into how students operate, is that the subject allows a flexible assessment package to the students. This means that the students themselves determine their level of engagement with the subject, based upon what assessment package will work best for them.

The flexible assessment package open to the students allows them to choose one of three options. The first option, “Option C” is chosen at the beginning of Week 4. This option means that tutorial participation and the mid-semester exam are compulsory. The second option, “Option B” is chosen at the beginning of Week 8. In Option B, the

students sit the mid-semester exam (pre-released four weeks prior). For those students that did not choose Option C, they have until the beginning of the mid-semester exam to decide whether they sit the exam and become an Option B student. If they do not choose to become an Option B student, they are opting to take a 100% final exam, and become an "Option A" student. The choice of assessment is important as it effectively signals the level of engagement the students have chosen. For those choosing Option B or C, they must engage earlier with the subject as they sit the mid-semester exam. Option A students do not complete this assessment task, and therefore are more likely to defer their engagement with the subject until closer to the final exam.

The nature of the optional assessment package allows a comparison to be made between students who attend tutorials and are engaged with the subject, students who do not attend tutorials but are engaged with the subject via other means and students who do not attend tutorials and are not engaged with the subject. This allows for a better understanding of whether it is tutorial attendance alone, engagement with the subject or a combination of the two, which drives student performance.

The results of this study show that student performance is much better for those students that engage with the subject earlier and more consistently (Option B and C students) as opposed to those that don't (Option A). When comparing between Option B and C students, consistent with prior research (i.e. Moore 2003, Gump 2005), tutorial attendance does seem to have a positive impact on performance. The relative impact on performance of the tutorial attendance factor is much less than the impact of student engagement.

The remainder of this paper is structured as follows. Section 2 will provide a review of the literature and Section 3 will discuss the methodology used in this study. Section 4 will provide the results, whilst conclusions and discussion will be presented in Section 5.

2. Literature Review

It has been noted that "the complex equation for academic success involves many more variables than attendance alone" (Gump, 2005 p21). However, due to the ease in

which attendance can be observed within the classroom setting attendance has often been used as a predictor for student performance. Numerous studies have examined whether attendance is linked to performance, and whilst Berenson et al. (1992) found no relation, the majority of studies (see, for example, Launius 1997, Clump et al. 2003, Thomas and Higbee 2000, Moore, 2003 and Gump 2005) have found a statistically significant positive relationship.

However, it is important to note that the attendance-performance relation from these studies may not be because the tutorials are value-adding for the students. On the contrary, there is evidence that points to students gaining no benefit from attendance: "tutors talk too much and are giving lectures rather than conducting dialogues" (Ramsden, 2003 p.194)[1]. In some cases compulsory attendance has been argued to actually reduce the learning of some students (Hyde and Flournoy, 1986).

Therefore whilst students that attend tutorials tend to perform better (as per Launius 1997, etc), there is also evidence that what happens in the classroom may not be the cause (as per Ramsden, 2003). As Vidler (1980, p590) notes: "students who are more likely to attend class tend to be those who do better on tests and examinations" but emphasises that attendance may not be the reason for this performance. He also notes that those students that attend tutorials regularly tend to be "academically curious", which is suggestive of a self selection bias.

The setting of this study, as will be discussed in the next section, allows for a finer partitioning to be made of the students in the subject. By comparing the results of those students who are engaged with the subject and attend tutorials, those students who are engaged with the subject and don't attend tutorials and those who are not engaged with the subject, a deeper understanding of what affects performance is gained.

[1] Whether or not the cause of this problem is the fault of the tutor can be debated elsewhere, but certainly there is evidence that students are also responsible to a degree. Collier (1985, p7) notes that students "are often silent and ill-prepared, and the tutor often finds himself giving a lecture".

3. Methodology

This study utilises data from a first year undergraduate business subject from a major Australian university. The subject is a core component of the university Business degree and is generally taken in first semester by those undertaking a business degree. It is also offered to a number of other degrees whose students require some basic knowledge of accounting. The primary teaching staff, as well as the topics covered, materials used and assessment package have been kept relatively consistent since at least 1999[2].

Assessment Options

It is the assessment package of this subject that makes this setting unique for research into the relationship between engagement and student performance. The assessment package offered in the subject allows students to choose from three different options. The students are informed about the assessment options in the lectures and the tutorials in each of the first four weeks of the semester.

Information about the options is available on the university discussion board website, as well as in the lecture and tutorial notes available online. Students also have access to the lecturers and tutors face to face and online in case they have questions about the assessment options. Suffice to say, students should have the time and information to be able to make an informed decision about which option they choose.

The first option, Option C, is chosen in the fourth week of semester. Option C means that the final exam is worth 60%, the pre-released mid-semester is worth 30% and tutorial attendance/participation is worth 10%. The mid-semester is pre-released in week 5, and attempted in week 9. As this option includes an attendance/participation component, it is compulsory for students to attend the tutorials. This is similar to the hybridized punishment-reward system as described in Beaulieu and Sheffler (1985).

[2] This does allow for regular updates to include contemporaneous issues and new edition texts as they occur.

If students do not choose Option C, they are still more than welcome to attend tutorials[3]. As mentioned previously, the mid-semester is pre-released. A student chooses the second assessment option, Option B, if they attempt the mid-semester. This choice is made if they sit the exam, and so enables the student to prepare for the exam (or not, if that is their choice) and make a decision at the last possible moment. If they choose to take the mid-semester, the mid-semester is worth 40% and the final exam 60%. If they choose not to sit the mid-semester, the final exam is worth 100%. This is Option A.

Students will commonly ask what the best option to choose is. In answering this question, two key points are regularly stressed. First, that historically those that do Option A perform significantly worse in the exam. Second, every person will have a different best option. Different hypothetical patterns of study preference are discussed, as well as the various costs/benefits of each package. Ultimately though, the teaching staff provide no direction as to which option the students should choose.

Data

This study encompasses student performance and results from Spring semester 2003 through to Spring semester 2006 inclusive[4]. The data is derived from the results sheets for each semester. The full sample provides 5423 individual student-semester results over the course of 7 semesters. Table 1 (below) provides the breakdown of student numbers by semester. The Autumn semesters are the "on" semester, with nearly double the number of students as the Spring semester. This is as Autumn semester is the first semester of the year, and this subject is offered in first semester to new students[5].

Insert Table 1 here

[3] Whilst there is no evidence of this, anecdotally only a small handful of non Option C students attend tutorials on even a semi-regular basis.
[4] Summer sessions are not included
[5] There may be need to partition by Autumn / Spring semester and re-test the results.

Analysis

As the primary aim of this study is to provide evidence of a link between student engagement with the subject material and performance, the first section of analysis will examine option choice and performance. Whilst it is impossible to uncover the extent to which a student is engaged with a subject, the three-way partitioning allows for engagement and attendance impacts to the separated.

On the spectrum of engagement, Option C students would be placed at the high end. Regardless of their underlying reasons for choosing Option C, the students have chosen an assessment package which requires them to not only attend weekly tutorials, but be prepared for those tutorials as well as participate. On the other end of the spectrum, Option A students will rarely attend weekly tutorials, and more than likely not be preparing the weekly work or mid-semester[6].

But whereas previous studies assume that attendance is an indication of engagement, the nature of the assessment option allows for this assumption to be more closely inspected. Option B students will sometimes, although not frequently, attend tutorials. Nor do they have to complete the weekly tutorial work. However, as they have chosen to sit the mid-semester, there is an indication of engagement with the subject. From an observational perspective these students are no different to Option A students, yet they are far more likely to be engaged with the subject matter than Option A students.

Therefore, it would be expected that Option C students perform better than Option A students. But because Option C students have both higher levels of engagement and attendance, what causes this increased performance cannot be ascertained. The inclusion of Option B should provide an answer to this question. If Option B students perform better than Option A students, but no different to Option C students engagement not attendance, is the critical factor. If the Option B students perform worse than Option C students, but no different to Option A students, attendance not engagement is the critical factor. The last scenario is that Option B students perform both better than Option A students, but worse than Option C students. This would be

[6] The assumption is that if a student had prepared for the mid-semester exam, then they would more than likely have sat the exam, rather than take the riskier option of a 100% final.

suggestive of both attendance and engagement being important factors in determining student performance.

The primary performance metrics used are overall subject mark and failure rates. These are important metrics as overall subject mark impacts on their Weighted Average Mark (WAM), whilst a failing grade indicates a student has shown insufficient knowledge to pass the subject. However, as the various options calculate the overall subject mark differently, overall subject mark and the failure rates do not provide a consistent metric of performance. As such, performance in the final exam, in total, as well as broken down into various sections, will be used to corroborate evidence from the subject mark.

The second part of the analysis focuses on the choices repeat students make. This will be achieved by documenting the assessment choice for students who have previously failed the subject and the performance of these students in the subsequent attempt. This is included to control for the potential self selection bias noted in the Literature Review[7].

4. Results

Option Choice

The first section of the results provides documentary evidence of how many students choose each assessment option. As detailed in Table 2, Option C has been the most popular choice with 38.08% of students choosing to not only engage with the subject, but attend tutorials as well. Just over one third (34.15%) of students choose Option B, whilst just over one quarter (27.86%) of students choose Option A. This does seem to provide some evidence that students, when given the choice, do choose to engage with the subject.

[7] Another way to control for this self selection bias would be to control for ability using the students' university entrance scores as a proxy for academic ability. However these scores are unavailable.

Insert Table 2 here

However, an interesting feature of Table 2 is highlighted in Figure 1. Whilst the 1511 students that choose Option A represents 27.86% of students attempting the subject, there seems to be a difference between the semesters. In Autumn semester, 818 students (25.33%) choose Option A as opposed to Spring semester when 693 students (31.60%) choose Option A. This suggests that the level of student engagement varies dependent on whether it is the "on" semester or "off" semester.

The second point of interest from Figure 1 is that whilst the percentage of students choosing Option A in Spring semester seems reasonably stable around 30%, the percentage of students choosing Option A in Autumn semester is growing. This growth has taken the average from 23.28% to 27.94% over three semesters, an increase of 4.66%. This may suggest that over time, new students to university are becoming less engaged, and more likely to take the "easy" assessment and participation option.

Insert Figure 1 here

Option Choice and Performance

The first way in which student performance is measured is to compare the average overall subject mark by assessment option type. As Figure 2 illustrates, the average mark for Option C was much lower than that for either Option B or Option C. This result is consistent when taking each semester individually or in aggregate.

The average for the students attempting Option C across the three and half year period was 43.47%, which is over 20 marks lower than the average for Option B (63.49%) or

Option C (65.37%). Using an independent samples t-test (untabulated[8]) to compare between the options, the differences between both Option A and Option B as well as Option B and Option C are statistically significant.

Insert Figures 2 and 3 here

Figure 3 documenting the failure rates by assessment option type, provides graphic evidence of the difference between the groups. The failure rate for Option A students is not just slightly higher, but over three times the failure rate for Option B students. For the total sample, the failure rate for Option A students stood at 51.49% as compared to 15.87% of Option B students and 11.67% of Option C students. The average in failure rates between Option A and Option B, as well as Option B and Option C are statistically significant.

The comparison between the performance of Option A, B and C students indicate that student engagement with the subject as well as tutorial attendance are factors driving student performance. As expected the performance of Option C students was significantly better than the performance of Option A students. The performance of Option B students is significantly better than Option A students, but significantly worse than Option C students.

To control for the mid-semester and participation mark potentially affecting the failure rates and averages, the following analysis is solely based on performance in the final exam. As each student has to sit the exam, and each is marked on a consistent basis, the only identifiable difference in performance is attributable to they way in which students prepared for the exam. As the final exam is 50% multiple choice, and 50% short answer the analysis of the final exam was separated along those lines.

[8] Tables available upon request

Figure 4 provides the results of the multiple choice component, whilst Figure 5 provides the results of the written component. Both Figures show the semester by semester results, as well as overall sample average. The results are consistent with Figures 2 and 3.

The average for Option A students in the multiple choice section is 53.38%. While close, the difference is statistically significant and lower than the Option B average of 57.71%. The Option B average is statistically insignificant from the Option C average of 57.65%.

For the written section, the average for Option A students in the written section is only 42.24%, which is far worse than their average in the multiple choice (53.38%). The average of Option A students is also significantly lower than the average for Option B students (53.75%), who in turn have a significantly lower average than Option C students (55.38%).

Insert Figures 4 and 5 here

Overall, these findings tend to suggest that not only do Option A students perform worse overall (significantly lower averages, significantly higher failure rates), but they also do worse on certain types of assessment task. The performance of Option A students seems to be much lower in written and short answer responses as compared to multiple choice questions.

This may be as a result of the manner in which they were able to prepare for the final exam. Given that Option A students are less engaged with the subject, the majority of "learning" of subject material would occur in the weeks between end of semester and the final exam. The short answer responses are exclusively from the second half of the subject, whereas the multiple choice questions come from the entire subject. A student trying to catch up and work systematically through the subject material (and running out of preparation time) would be in a better position to answer the multiple choice questions as opposed to the short answer questions.

Repeat Students and Subsequent Performance

The second part of this study examines the assessment package choice and performance of repeat students. This is in an attempt to control for the potential self selection bias noted by Vidler (1980) that "academically curious" students more likely to attend tutorials. If students with more academic ability or more "academically curious" were more likely to attend tutorials, then the results from the previous section may be due to the type of student rather than attendance or engagement.

The subsequent performance of a repeat student, especially Option A students, will not only provide an insight into whether there is a self selection bias, but also whether repeat students (especially Option A students) learn from their past mistakes.

The sample of repeat students is drawn from a 3 year period beginning Autumn 2004 and ending Spring 2006[9]. Within this period there were 518 identified repeat students. Table 3 shows, not surprisingly, that the majority of the repeat students (308) are former Option A students. However, considering their lack of performance in the subject in the prior semester, over half (58.77%) of these former Option A students choose the same assessment option again.

Former Option B and C students on the other hand, tend to stay reasonably engaged with the subject, with 71.42% of former Option B and 69.23% of former Option C students choosing either Option B or C. Overall 50.97% of failed students chose the same assessment option as the option they choose when they failed.

Insert Tables 3 and 4 here

Table 4 provides the number of failures and failure rate for repeat students, partitioned by subsequent assessment package choice. Two key points can be made of these

[9] This did not include summer sessions.

results. First, the failure rate for repeat students is higher than for the full sample. Across each Option, repeat students have an approximately 15% higher failure rate than the full sample.

Second, whilst 66.30% of former Option A students who again chose to sit a 100% final exam (Option A) failed, those that did not pick Option A did significantly better. For repeat students who chose Option A originally, but chose either Option B or C the second time around, only around a quarter failed.

Overall the results of Table 4 suggest that Option A students who fail, tend not to learn from their past mistakes, do not engage with the subject and fail again. In relation to the self selection bias issue, the results of the former Option A students tend to suggest that there is some self selection as the failure rates are higher, even when partitioned by subsequent choice. The key point to be made though, is that whilst Option A students may not be as strong academically as the other Options, when a repeat Option A student chooses to engage with the subject in the subsequent attempt, the performance of that student is significantly better than a repeat Option A student who does not engage in the subsequent attempt.

5. Conclusions and Discussion

The research aim of this study is to provide further evidence as to what drives student performance. By utilising a unique setting whereby students can choose their own assessment package it is possible to separate between tutorial attendance effects and student engagement effects on performance.

Overall the findings from the performance of over 5000 students undertaking a first year accounting subject at a major Australian university were that both tutorial attendance and student engagement seemed to impact positively on student performance. In terms of the relative impact however, student engagement with the subject was by far the dominant factor in student performance.

What does this mean for teaching academics, especially for those with large first-year subjects? First, the importance of engaging with the student population cannot be stressed enough. Tutorial attendance does not necessarily mean engagement, but similarly lack of attendance does not necessarily mean lack of engagement. The higher education environment students are now a part of has drastically changed, especially for students studying business or commerce degrees. The rising cost of degrees and the importance of career (with many more students working part or full time than previously) have led to students have less available time to commit to university. As such, many will seek the most cost-efficient method for engaging with the course material. For many, if they have access to the information they need, tutorial attendance becomes optional.

However this also assumes that these teenagers (the majority of first year university students are 17-18 years old) are able to make the optimal decision with regard to how to relate to the subject. This leads to the second point. Whilst the findings from this study tend to suggest that compulsory tutorial attendance is not necessary, what is necessary is to ensure that the subject material and design is such that students are engaged with the subject. What this means in an operational sense is a decision to be made by individual academics, but is an important consideration to take into account.

An ancillary finding from this study is that a non-trivial proportion of students (27.86%) choose to disengage from this subject. Whether or not this lack of engagement by these students is limited to this particular subject, or is reflective of their attitude to university in general is not known, and may be a potential for future research. If it is subject specific, it would be reflective of how accounting is perceived by first year students, and needs to be discussed at a Faculty or Department level. If university wide, then it is an issue that needs to be addressed by the university, as this study shows, the performance of these students is extremely poor.

Suffice to say, there are a number of limitations in this particular study. Whilst there seems to be a relationship between student engagement and performance, causality cannot be inferred from such findings. Nor can other factors, which may drive choice as well, be discounted from as drivers of performance.

As a quantitative study, albeit with a large sample, it is not possible to gain the truly deep insights into this issue that a qualitative study would provide. A fruitful avenue for further research would be to interview students as to why they chose the assessment package they did, and to get a feel for actually how engaged with the subject they are, and potentially why they are or are not engaged with the subject.

Another potential area for future research would be to conduct a longitudinal study of student performance over the course of the degree, to assess whether engagement (or lack thereof) in first-year has an impact on their overall performance. This would provide evidence of whether a students' initial engagement with the university system is a once-off, or sets the tone for their degree.

6. References

Beaulieu, R. P. and D. E. Sheffler. 1985. Controlling absenteeism: Reward versus punishment contingencies. *Journal of Instructional Psychology*, Vol. 12: 72-79.

Berenson, S., G. Carter and K. Norwood. 1992. The at-risk student in college developmental algebra. *School Science and Mathematics*. Vol. 92 (2): 55-98.

Clump, M. A., H. B. Bauer and A. Whiteleather. 2003. To attend or not to attend: Is that a good question? *Journal of Instructional Psychology*, Vol. 30: 220-224.

Collier, K. 1985. Teaching methods in higher education – the changing scene, with special reference to small-group work. *Higher Education Research and Development*. Vol. 4 (1): 3-27.

Gump, S. E. 2005. The Cost of Cutting Class: Attendance as a predictor of student success. *College Teaching*. Vol. 53 (1): 21-26.

Hyde, R. and D. Flournoy. 1986. A case against mandatory lecture attendance. *Bulletin of the Psychonomic Society*. Vol. 24 (1): 63-64.

Launius, M. H. 1997. College student attendance: Attitudes and academic performance. *College Student Journal*. Vol 31: 86-92.

Moore, R. 2003. Attendance and performance: How important is it for students to attend class? *Journal of College Science Teaching*. Vol. 32 (6): 367-371.

Ramsden, P. 2003. *Learning to Teach in Higher Education*. Second edition. Routledge Falmer, London.

Thomas, P. and J. Higbee. 2000. The relationship between involvement and success in developmental algebra. *Journal of College Reading and Learning*. Vol. 30 (2): 222-232.

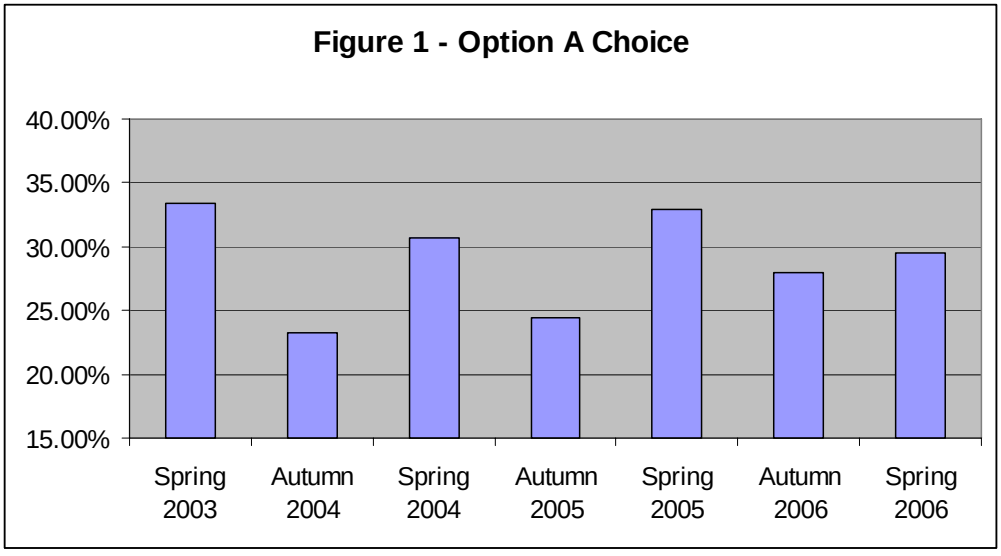
Vidler, D. C. 1980. Curiosity, academic performance, and class attendance. *Psychological Reports*. Vol. 47: 589-590.

7. Tables and Figures

Table 1 - Student Numbers By Semester	
Semester	Students
Spring 2003	539
Autumn 2004	958
Spring 2004	514
Autumn 2005	1123
Spring 2005	544
Autumn 2006	1149
Spring 2006	596
TOTAL	5423

Table 2 - Option Choice By Semester

	Option A	Option B	Option C	Option A %	Option B %	Option C %
Spring 2003	180	178	181	33.40%	33.02%	33.58%
Autumn 2004	223	327	408	23.28%	34.13%	42.59%
Spring 2004	158	180	177	30.74%	35.02%	34.44%
Autumn 2005	274	411	439	24.40%	36.60%	39.09%
Spring 2005	179	176	192	32.90%	32.35%	35.29%
Autumn 2006	321	377	451	27.94%	32.81%	39.25%
Spring 2006	176	203	217	29.53%	34.06%	36.41%
TOTAL	1511	1852	2065	27.86%	34.15%	38.08%



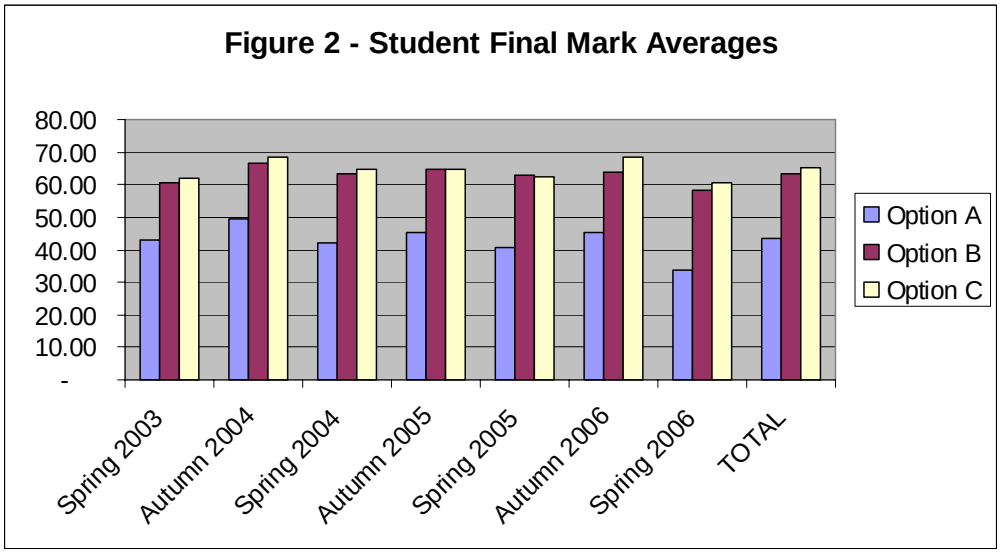


Figure 2 - Student Final Mark Averages
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
-
Spring 2003
Autumn 2004
Spring 2004
Autumn 2005
Spring 2005
Autumn 2006
Spring 2006
TOTAL
Option A
Option B
Option C

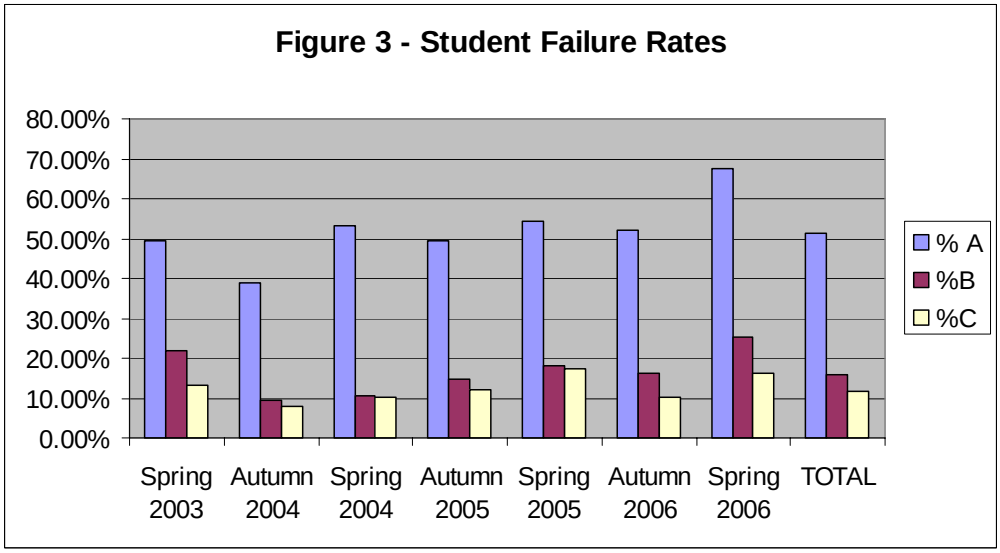


Figure 3 - Student Failure Rates
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
Spring 2003
Autumn 2004
Spring 2004
Autumn 2005
Spring 2005
Autumn 2006
Spring 2006
TOTAL
% A
%B
%C

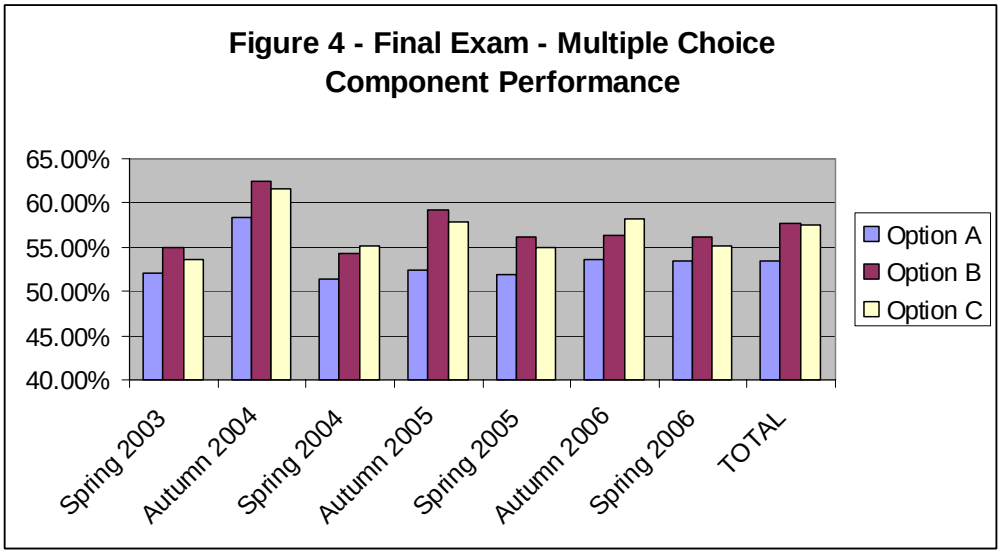


Figure 4 - Final Exam - Multiple Choice Component Performance
65.00%
60.00%
55.00%
50.00%
45.00%
40.00%
Spring 2003
Autumn 2004
Spring 2004
Autumn 2005
Spring 2005
Autumn 2006
Spring 2006
TOTAL
Option A
Option B
Option C

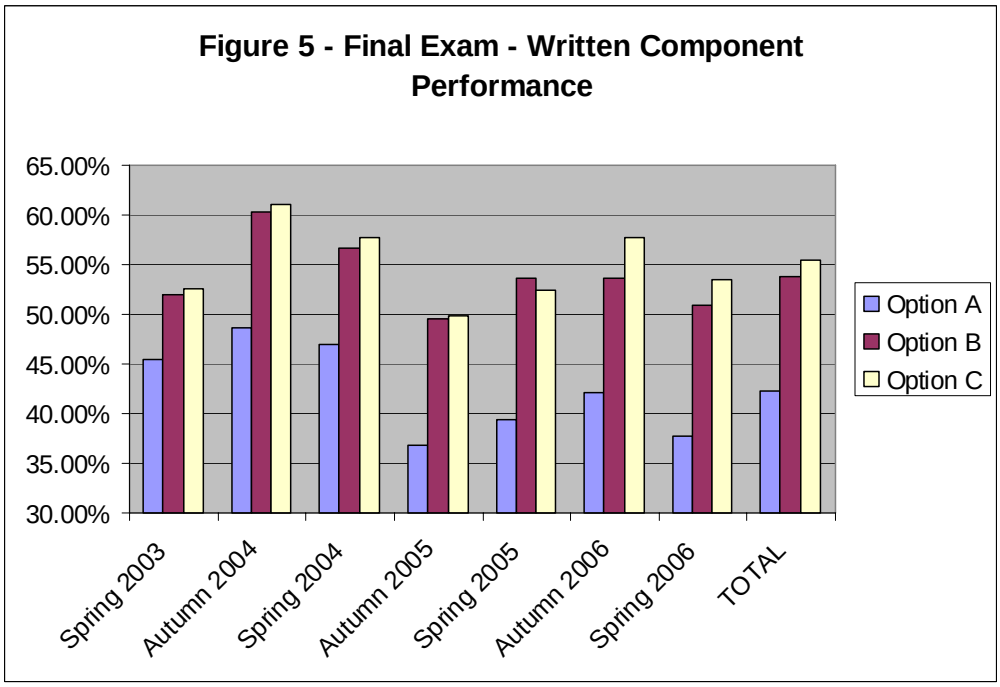


Figure 5 - Final Exam - Written Component Performance
65.00%
60.00%
55.00%
50.00%
45.00%
40.00%
35.00%
30.00%
Spring 2003
Autumn 2004
Spring 2004
Autumn 2005
Spring 2005
Autumn 2006
Spring 2006
TOTAL
Option A
Option B
Option C

Table 3 - Repeat Student Option Choice							
Prior Option	Students	Option A	Option B	Option C	Option A	Option B	Option C
Option A	308	181	58	69	58.77%	18.83%	22.40%
Option B	119	34	43	42	28.57%	36.13%	35.29%
Option C	91	28	23	40	30.77%	25.27%	43.96%
TOTAL	518	243	124	151	46.91%	23.94%	29.15%

Table 4 - Repeat Student Option Choice - Performance						
Prior Option	Option A	Option B	Option C	Option A	Option B	Option C
Option A	120	15	19	66.30%	25.86%	27.54%
Option B	25	13	5	73.53%	30.23%	11.90%
Option C	20	6	14	71.43%	26.09%	35.00%
TOTAL	165	34	38	67.90%	27.42%	25.17%